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Trade Openness, Gains from Variety and Government Spending*

Sandra Hanslin†

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Abstract

This paper investigates empirically the effect of import diversity on government size and provides evidence for the love of variety effect on government spending described in Hanslin (2008). I argue that crowding out of firms is an important cost of public good provision. However, due to the access to foreign varieties, national costs of public good provision are lower and therefore, public good provision is higher. Especially for OECD countries this channel seems to exist. The diversity of imported products has a positive effect on government consumption, particularly when these goods are classified as differentiated. In addition, this positive effect is decreasing in home market size. Further, the direct effect of the share of differentiated in total imported products on the government share is negative.

Keywords: International trade, trade openness, public expenditure, gains from variety.

JEL Classification: F10, H10.

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1 Introduction

Through the increasing international integration of goods markets new challenges for the public sector arise. On the one hand, a large literature points out that an increase in competition between countries puts pressure on governments and leads to a race to the bottom. An increasing integration of markets erodes the tax base and therefore tends to increase the costs of public goods provision. On the other hand, governments have the possibility to increase public good provision on costs of foreign countries. The literature discusses two channels, how costs of public good provision can be exported: (i) due to the terms of trade effect (TOTE) and (ii) the love of variety effect (LOVE).

The TOTE is discussed in the theoretical contributions by van der Ploeg (1987), Turnovsky (1988), Devereux (1991) and Anderson et al. (1996). They show that in open economies the costs of taxation can be exported if changes in public spending influence the terms of trade. Anderson (2006) and Epifani and Gancia (2009) argue that increasing integration of goods markets reinforces this effect which leads to larger governments. The terms of trade effect (TOTE) may be illustrated as follows. Since the public sector has a stronger home bias than the private sector, a shift from private to public expenditure increases the demand for domestic goods. This in turn leads to a crowding out of exports and to an increase of domestic prices. Epifani and Gancia (2009) find empirical evidence for the TOTE. That is, the positive effect of openness on the share of government consumption is conditional on a low elasticity of substitution.

The second channel, the love of variety effect (LOVE), I highlighted in an earlier theoretical paper (Hanslin, 2008). In a Dixit-Stiglitz-Krugman framework, if the public sector produces a consumption good and employs the same resources as the private sector, an important cost of the public sector is its negative effect on the number of firms. However, with integrated goods markets consumers have access to foreign varieties. Therefore, the national costs of public good provision in terms of utility are lower and optimal public good provision is higher in open economies than in closed ones. One crucial assumption for this result to hold is that consumers have a love of variety. Almost three decades ago, new trade theory starting with Krugman (1979, 1980), Ethier (1982) emphasized on the importance of gains from trade due to the import of new varieties. It took some time until first empirical studies quantified these gains from variety. Broda and Weinstein (2006) show that imports of new varieties at a very disaggregated level brought welfare gains to

the United States arising from a decrease in the consumer price index. In Broda and Weinstein (2004) it is shown that new imported varieties on the four-digit level have lowered prices and brought an increase in welfare for many countries. In another study Broda et al. (2006) show that there are productivity gains in various countries arising from new imported products.[1]

The contribution of this paper is to provide empirical evidence for the LOVE and hence, the following hypothesis deduced from Hanslin (2008). First, a broad access to foreign varieties should increase the government share relative to GDP. Second, if love of variety is high, the government share should be small. This follows from the high costs of public good provision if there is high love of variety. Third, since gains from variety are larger the smaller the country, country size should be negatively correlated with the government share. Fourth, the positive effect of imported varieties on government share should be smaller the larger the country.

This paper differs from most existing empirical literature discussing the effect of trade openness on government size mainly in the measure for openness. In a seminal paper Rodrik (1998) finds a positive effect of openness (export plus import relative to GDP) on government spending. Other literature (e.g., Garrett, 2001; Epifani and Gancia, 2009) confirms this positive relationship, although different theoretical considerations lie behind. The standard measure of openness does not allow to distinguish between exports and imports and neither between the intensive and extensive margin.[2] This paper focuses on the extensive margin of imports. This allows to match the gains from trade to the gains from variety and hence, a close test of the aforementioned theoretical model.

The measure for the diversity of imports is obtained by counting the different imported products from the rest of the world. A product in this paper is defined at the four-digit level of the Standard International Trade Classification (SITC) code, Revision 2, reported in the NBER U.N. trade data by Feenstra et al. (2005). Unfortunately, there is a change in reporting trade in 1984. While from 1964 until 1983 each product independent of the trade value is reported, from 1984 until 2000 low valued trade flows below \$100'000 are not reported. Because of data reliability and the before mentioned censoring, the main

[1] The empirical evidence provided in Broda and Weinstein (2004, 2006) are closer to Krugman while Broda et al. (2006) provide evidence for the Ethier-framework.

[2] A bulk of international trade is driven by the extensive margin. The importance of the extensive margin in exports is quantified in Hummels and Klenow (2005) where it is found that 60% of greater exports of larger economies is due to variation in the number of exported products. To my knowledge, there is no study quantifying the extensive and intensive margins for imports.

focus is put on the early OECD sample covering the years from 1964 to 1983.

Estimating panel fixed effect regressions for OECD and non-OECD countries and different time spans, I find strong and very robust results for the LOVE in the early non-censored OECD sample. The number of different imported products has a positive effect on government consumption as a share of GDP. This positive effect works especially if it is accounted for the number of differentiated[3] imported products. Further, in line with the theoretical model, I find that the positive effect of new imported varieties on government consumption is decreasing in country size. In addition, the share of differentiated imported products affects government consumption negatively. I argue that the share of differentiated products in the consumption basket is positively correlated with the love of variety and therefore, costs of public good provision are higher.

The paper is organized as follows. Section 2 presents a simple version of the theoretical model of Hanslin (2008) from which four testable implications are derived. Section 3 describes the empirical model and the data. Section 4 presents the main results and section 5 provides robustness checks. Finally, section 6 concludes.

2 A simple model

This section presents the theoretical framework in order to illustrate the LOVE on government spending highlighted in Hanslin (2008). In order to focus on the main implications I concentrate on the simplest possible version.[4]

There are two countries, home (H) and foreign (F), which differ in the amount of labor endowment (country size). In each country there is a private and a public sector, both producing consumption goods. The public sector employs a share g_i ($i = H, F$) of labor endowment $\bar{L}_i$ and produces the nontraded public good according to a linear production function, $G_i = g_i \bar{L}_i$. The representative household's income is given by $w_i \bar{L}_i$, where w_i denotes the wage rate in country i. Net income - income available for consumption of private goods - is given by $I_i := w_i \bar{L}_i - T_i$, where $T_i = g_i w_i \bar{L}_i$ is the income tax imposed by the government. The private sector is characterized by a continuum of industries of measure 1 indexed by $j \in [0, 1]$. In each industry and country various firms produce differentiated goods under monopolistic competition. Each firm is a monopolist for one variety, after having incurred some fixed cost. There is free market entry, that is, the

[3] According to the classification by Rauch (1999).

[4] A richer version of the model is found in Hanslin (2008).

equilibrium number of firms in an industry is endogenously determined. I assume free trade between the two countries in an exogenous fraction of industries $\tau \in [0,1]$ and no trade for the remaining fraction $1-\tau$. Without loss of generality I refer to trading industries with index $j \leq \tau$ and to the nontrading industries with index $j > \tau$.[5]

The representative household derives utility from consumption of different varieties in each industry and the country specific public good G. Household's preferences for private goods versus the public good is captured in the parameter $\eta \in (0,1)$.

$$U_i = \eta \int_0^1 \log\left[Y_{ij}\right] dj + (1-\eta)\log\left[G_i\right] \quad for \quad i = H, F \tag{1}$$

where subutility Y_{ij} is a CES aggregator of the varieties consumed in industry j

$$Y_{ij} = \left(\int_{k \in \mathscr{N}_{ij}} \left(y_{kj}^i\right)^{\nu} dk \right)^{\frac{1}{\nu}}, \quad i = H, F, \tag{2}$$

with $\nu \in (0,1)$. $\nu < 1$ implies that the household has a love of variety. y_{kj}^i denotes consumption of variety k in industry j by the representative household in country i. The elasticity of substitution between any two varieties from industry j is given by $\sigma = \frac{1}{1-\nu}$. The assumption $\nu \in (0,1)$ implies $\sigma > 1$. Within any industry $j > \tau$, the household can only consume varieties produced in the own country, within an industry $j \leq \tau$, the household consumes all varieties produced in both countries. An increase in τ implies broader access to foreign varieties and, because of love of variety, an increase in utility. $\mathscr{N}_{ij}$ is the index set of all varieties from industry j which are available in country i. Since the elasticity of substitution between the subutilities Y_{ij} is equal to 1, the household allocates net income equally among all industries. Moreover, since the measure of all industries is equal to 1, expenditures per industry equal net income I_i.

Each firm in an industry produces one variety with labor according to the following production function with increasing returns to scale

$$x_{kj} = \begin{cases} A(L_{kj} - L^*) & \text{if } L_{kj} \geq L^* \\ 0 & \text{otherwise} \end{cases} \tag{3}$$

where x_{kj} denotes output of firm k in industry j located in country H or F. L_{kj} is the labor input of an individual firm, A denotes labor productivity and L^* the overhead

[5] This way of modeling openness is due to Epifani and Gancia (2009).

labor needed to run the plant. Because of the fix cost the firms have an incentive to specialize and the number of firms (n_i) equals the number of varieties. The assumption of monopolistic competition with free firm entry within each industry implies for the price of each variety, quantity and the number of firms respectively

$$p = \frac{w}{A\nu} , \quad x = \frac{AL^*\nu}{(1-\nu)} , \quad n_i = \frac{(1-g_i)\bar{L}_i}{L^*}(1-\nu) . \tag{4}$$

Because firms are identical and countries differ only in country size and government share, output per firm x and price p are equal for all firms and independent of country of production.[6] The government employs $g_i\bar{L}_i$ for public good production and $(1-g_i)\bar{L}_i$ remains available for production of private goods. The price p and the quantity per firm x are independent of government activity and equalized between the two countries. However, since the endowment left for the private sector is decisive for the number of firms in the market, an expansion of the public sector reduces the number of active firms.[7]

In order to determine optimal public good provision the indirect utility of the representative household is maximized. The government share in the foreign country is taken as given.

$$\max_{g_i} \quad \eta\tau \log\left[Y_{i,j\leq\tau}(g_i, g_{i'})\right] + \eta(1-\tau)\log\left[Y_{i,j>\tau}(g_i)\right] + (1-\eta)\log\left[G_i(g_i)\right] . \tag{5}$$

s.t.

$$\begin{aligned} Y_{i,j>\tau}(g_i) &= (n_i(g_i))^{\frac{1}{\nu}}\, x \\ Y_{i,j\leq\tau}(g_i, g_{i'}) &= \left(\frac{I_i(g_i)+I_{i'}(g_{i'})}{I_i(g_i)}\right)^{\frac{1-\nu}{\nu}} Y_{i,j>\tau}(g_i) \end{aligned} \tag{6}$$

where $I_i(g_i) = n_i(g_i)px$. This optimization problem results in the following first order conditions:

$$\underbrace{\eta\tau\frac{1-\nu}{\nu}\left(\frac{1}{1-g_i} - \frac{1}{1-g_i+(1-g_{i'})\bar{L}_{i'}/\bar{L}_i}\right)}_{>0} \underbrace{-\frac{\eta}{\nu}\frac{1}{1-g_i}}_{<0} + \underbrace{(1-\eta)\frac{1}{g_i}}_{>0} = 0 , \tag{7}$$

for $i, i' \in \{H, F\}$ and $i \neq i'$.

The third term in equation (7) represents the positive marginal utility of a higher supply of the public good. The second term represents the marginal utility loss due to the

[6] Wages are equal between the two countries as in equilibrium the following must hold $\frac{p_H}{p_F} = \left(\frac{x_F}{x_H}\right)^{\frac{1}{\sigma}}$.

[7] Note that the TOTE is excluded.

crowding out of private firms in tradable and nontradable industries. The first bracket is positive and dampens the negative effect of the second term. This positive effect comes from the fact that domestic public good production affects only the number of domestic firms - not the number of available foreign varieties. Since households have a love of variety, subutility in open industries is higher than in closed ones. Due to the crowding out of domestic firms, the number of domestic relative to foreign varieties decreases which increases the relative utility gain in open industries. The dampening effect (first term in (7)) is larger the more varieties the country imports (measured by τ). Further, it is larger, the stronger is the love of variety and the smaller the country.

Since households have a love of variety ($\nu < 1$), an increase in τ reduces the national cost of public good provision. For instance, a decontrol of protected industries or new technologies which make trade more feasible in certain industries may be reflected in an increase in τ. An opening of industries enables access to new varieties and therefore, households' utility increases.

According to equation (7) we can conclude that costs of public good provision are low if the country imports a lot of different varieties (τ large), if love of variety is low (ν large) and the country is relatively small ($\bar{L}_i$ low). Since the share of government consumption is higher the smaller the national costs of public good provision, the following holds in equilibrium (applying the implicit function theorem to equation (7)):[8]

$$\frac{\partial g_i}{\partial \tau} > 0 \,, \tag{8}$$

$$\frac{\partial g_i}{\partial \nu} > 0 \,, \tag{9}$$

$$\frac{\partial g_i}{\partial \bar{L}_i} < 0 \,. \tag{10}$$

Further, gains from imported varieties are smaller, the larger the country:

$$\frac{\partial^2 g_i}{\partial \tau \partial \bar{L}_i} < 0 \,. \tag{11}$$

3 Empirical Model and Data

The empirical work attempts to provide evidence on the following hypothesis:

i. *The number of imported products has a positive effect on the government share if the*

[8] Proofs of these results are found in Hanslin (2008).

imported products are differentiated. (see eq. (8))

ii. *A high share of differentiated products in imports implies a low government share.* (see eq. (9))

iii. *A high GDP implies a low government share.* (see eq. (10))

iv. *The positive effect of imported products on the government share is decreasing in country size.* (see eq. (11))

Although τ is a bilateral measure for openness, what drives the result are the welfare gains from new imported varieties. While the hypothesis i, iii and iv should be intuitively clear, hypothesis ii requires an explanation. I argue that the composition of the consumption basket and therefore also the composition of the imported products provide information for the country's preferences. If the share of differentiated on total imported products is large, households value differentiated goods more. This in turn implies that love of variety (LOV) is high. The theoretical model predicts that LOV has a negative effect on the government share because of higher costs of public good provision. Therefore, we should observe a negative correlation between the share of differentiated imports and the government share.

In view of the aforementioned hypothesis the following equation is estimated.

$$\begin{aligned} g_{it} =& \beta_1 importdiv_{it} + \beta_2 \left(importdiv_{it} \times loggdp_{it}\right) + \\ & \beta_3 diff_{it} + \beta_4 \left(importdiv_{it} \times diff_{it}\right) + \\ & \beta_5 loggdp_{it} + \boldsymbol{\beta_6'} \boldsymbol{X_{it}} + \eta_t + \mu_i + \epsilon_{it} \end{aligned} \tag{12}$$

where i indexes countries, t indexes time, g_{it} denotes government consumption as a log share of GDP, $importdiv_{it}$ is the number of different imported products (normalized), $diff_{it}$ is the share of differentiated on total imported products, $loggdp$ is log of GDP, other time varying potential covariates are included in the vector X_{it}, η_t are time fixed effects (controls for global shocks), μ_i denotes country fixed effects (controls for time-invariant omitted-variable bias) and ϵ_{it} is the idiosyncratic error term.

The data is drawn from various sources. Following the previous studies on openness and government spending, as for instance Rodrik (1998) and Epifani and Gancia (2009), the measure for government size (g) is government consumption as a share of GDP from Heston

et al. (2006) (Penn World Tables 6.2, henceforth PWT).[9] Figure 1 plots the unweighted sample means of the share of government consumption over time for OECD[10] and non-OECD countries separately. A few things stand out. The share of government consumption is much lower in the OECD subsample. The peak around 1993 in the OECD subsample is due to Czech Republic, Hungary, Poland and Slovak Republic. The jump in 1970 in the non-OECD sample is mainly due to the high government share of countries for which data on the government spending is only available for 1970 and onwards.

In this paper a product is defined on the four-digit level. The measure for import diversity (*importdiv*) used in this empirical study is the number of different imported products from the rest of the world, normalized by the sum of all traded products in the world between 1964 and 2000.[11] Let $J_{it}^{j} = 1$ if country i imports a strictly positive amount of product j in year t and zero otherwise.

$$importdiv_{it} = \frac{\sum_j J_{it}^j}{\sum_i \sum_t \sum_j J_{it}^j}$$

where the denominator is equal to 1069 for the time period 1964 to 2000. The data source for the measure of import diversity is the NBER U.N. trade data by Feenstra et al. (2005) where imports and exports are reported in the Standard International Trade Classification (SITC) code, revision 2, at the four-digit level. The disadvantage of these less disaggregate four-digit trade flows is that the increase in the number of varieties is underestimated. However, since we are primarily interested in providing evidence for the LOVE, we are more concerned about qualitative than quantitative effects. The advantage of the four-digit data is its insensitiveness against false increases due to splitting of product categories and "replaced" products due to technological progress. Endogeneity might not be a big issue in this case since variation on four-digit level are driven rather through trade liberalization than changes in demand (see Kehoe and Ruhl (2009)). Further, goods on this aggregate level are more differentiated. This implies that consumption of an additional

[9] According to Rodrik (1998) this measure includes only government consumption and no public investments or income transfers.

[10] From the OECD sample Luxembourg is dropped since trade data are only available for Belgium-Luxembourg. We treat Luxembourg as negligibly small and assign the combined information to Belgium. Results are robust concerning the exclusion of Belgium. The observations of Norway for the second period are dropped since the trade data shows a curious pattern. Results are also robust if Czech and Slovak Republic are excluded.

[11] The only reason for the normalization is to obtain a measure between zero and one. $importdiv = 1$ implies that a country imports each four-digit product which has been traded at least once between 1964 and 2000 between any two countries.

variety brings about larger gains. The distribution over time of the diversity measure is provided in figure 2.

The share of differentiated imported products is computed using Rauch (1999)'s liberal classification.[12] Rauch (1999) divides commodities into three categories: Differentiated goods, reference priced goods and goods traded on organized exchanges.[13] According to Rauch (1999): "Possession of a reference price distinguishes homogeneous from differentiated products. Homogeneous commodities can be further divided into those whose reference prices are quoted on organized exchanges and those whose reference prices are quoted only in trade publications."[14] Broda and Weinstein (2006) provide estimations of the elasticity of substitution for the three commodity groups which are summarized in table 18. They find that the average elasticity of substitution of goods classified as differentiated is much lower than the one of goods traded on organized exchange. Goods classified as reference priced have (on average) a slightly higher elasticity of substitution than differentiated goods and a much lower elasticity than goods traded on organized exchange. Therefore, countries with a large share of differentiated goods have on average a lower elasticity of substitution. Based on these elasticities, it is not obvious that one should focus on the group of differentiated goods only. It can be argued that the group classified as differentiated captures too few differentiated goods. However, the group of reference priced goods is quite heterogeneous concerning the estimated elasticities and may contain a too broad set of goods. Nevertheless, since the difference between the average elasticity of substitution of reference priced goods and differentiated goods is very small, I distinguish between two measures for the share of differentiated imports. The restrictive measure $diff_r$ stands for the share of differentiated commodities while the liberal measure

[12] Rauch (1999) distinguishes between the liberal and conservative measure. He writes: "Because ambiguities arose that were sometimes affect the classification at the [...] four-digit level, both 'conservative' and 'liberal' classifications were made, with the former minimizing the number of [...] four- digit commodities that are classified as either organized exchange or reference priced and the latter maximizing those numbers."

[13] The shares of four-digit products falling into these liberal classifications are 55%, 28% and 18% respectively.

[14] Examples of differentiated goods are: newspapers journals, periodicals; spectacles and spectacle frames; footwear; blouses of textile fabrics; telecommunications equipment; cutlery; woven fabrics; fresh or dried figs; non alcoholic beverages; etc. Reference priced goods are, for instance: fresh milk and cream; frozen fish fillet; fresh apples; natural honey; cigarettes; electric current; etc.

$diff_l$ for the share of differentiated plus the share of reference priced goods. More formal:

$$diff_r = \frac{\sum_j d^j J_{it}^j}{\sum_j J_{it}^j}$$
$$diff_l = \frac{\sum_j (d^j J_{it}^j + r^j J_{it}^j)}{\sum_j J_{it}^j}$$

where $d^j = 1$ ($r^j = 1$) if product j is classified by Rauch as differentiated (reference priced) and equal to zero otherwise. Figure 3 plots the distributions of the two measures over time.

Real GDP in purchasing power parity (PPP) dollars at 2000 prices (Laspeyres) is drawn from PWT. Other variables drawn from PWT are population and the widely used measure for trade openness which is export plus import as a share of real GDP in constant prices. According to the previous literature trade openness is lagged one period to reduce the endogeneity problem. Both variables are logarithmized and in the following referred to *logpop* and *lagopenness*. Further potential covariates for which it is controlled for are the political regime (*polity2* from the Polity IV dataset), dependency ratio (*depend*) to control for demographic characteristics, urbanization rate (*urban*) and whether the country was affected by or involved in violence and wars (*war*). The *polity2* is an composite Polity index which ranges from -10 (hereditary monarchy) to 10 (consolidated democracy). It is the difference between the Polity Democracy index and the Polity Autocracy index (both ranging from zero to ten). The dependency ratio, which is the share of population below 15 and beyond 64, relative to the population between 15 and 64, is constructed using World Development Indicators from World Bank (henceforth WDI). The urbanization rate (the share of population living in urban areas) is also drawn from WDI. The measure for violence/war is ACTOTAL from Major Episodes of Political Violence (MEPV) and conflict regions which ranges from zero (no violence) to ten. This composite index consists of international violence and war, civil violence and war and ethnic violence and war.[15] A detailed list of sources and definitions for each variable is provided in Appendix B.

The unbalanced panel data covers 156 countries (the full list is reported in Appendix B) of a time span from 1964 to 2000. Unfortunately, there is a change in reporting trade flows in the World Trade Data between 1983 and 1984. After 1984 trade flows below $100'000 per year were not reported in the original data from United Nations. However, Feenstra et al.

[15] In order to obtain an idea for the dimension of this measure, United States, for instance, have an ACTOTAL equal to 2 in the years 2003 and 2004.

(2005) indicate that some adjustments had been made for these low valued trade flows. This break can be seen clearly in figure 2, where the distribution of the variable *importdiv* is plotted over time. The difference between the OECD and non-OECD countries is distinct. While the sample average among OECD increased after 1983 it dropped for non-OECD. Further the distribution for non-OECD after 1983 is much broader than it is before, especially there is a much longer tail at the bottom. This indicates that for many developing countries a lot of low valued trade flows were not reported and therefore, the number of imported varieties is underestimated for many countries.[16] The distribution for the OECD sample has increased only slightly. The reason for this upward jump may lie in the different data source. If this structural break in *importdiv* is only a level effect we control for it with the inclusion of time dummies. However, this figure suggests that it seems wise to look at the different time and country sample separately.

All variables are computed as four year averages, except the last period which covers five years. Hence, there are five periods from 1964 until 1983 and four periods from 1984 to 2000. Table 1 provides descriptive statistics (sample means, standard deviations and extreme values) of the variables, separately for OECD and non-OECD and the two time periods.

4 Regressions

According to the theoretical model we have the following predictions on the coefficients in equation (12). We expect β_1 to be positive if we do not include the interaction term $importdiv \times diff$. If we include the interaction term, β_1 should not be significantly different from zero while β_4 should be positively significant. The reason is, that import of new varieties does only bring gains from trade if the goods are differentiated. And the more so, the more differentiated the varieties. β_2 is expected to be negative, since the gains from variety should decrease in the country size.[17] The sign of β_3 is also expected to be negative. The share of differentiated goods in the import basket implies that differentiated

[16] A further reason for the underestimation of the number of imported goods might be that after 1984 there are only 72 reporting countries. For the non-reporting countries import data is only available through the export information of the reporting countries.

[17] Existing theories about how country size may affect the share of government consumption is manifold. Assuming that the public good is a normal good we should expect it to increase with GDP. According to Wagner's law the government share should increase as the economy develops. According to Alesina and Spolaore (1997) larger countries have a smaller government share due to economies of scale in public good provision. Empirical evidence for these hypothesis is given in Alesina and Wacziarg (1998) where it is shown that the share of government consumption is smaller in larger countries and that small countries tend to be more open to trade.

varieties are more important for the consumer, indicating a higher love of variety. A high love of variety implies that there are high national cost of public good provision. The parameter for market size *loggdp* is expected to be negative. Because of the interaction term of GDP with the diversity of imports, β_5 might also become insignificant as the parameter β_2 captures the lower gains from trade if the country is larger.

The analysis starts with a baseline regression of pooling all countries and time periods. The main focus, however, lies on the OECD country sample with special weight on the first period where data quality is best and the multicollinearity problem is less severe.[18]

Baseline Regression

Table 3 presents regression results for the whole country sample. In addition to time dummies, the dummy variable $oecd \times after84$ allows for different structural breaks between the two country groups (as suggested by figure 2). Further, in all columns it is controlled for level of development and country size, that is log GDP and log population.[19] GDP is negatively and log of population positively significant, implying that GDP per capita has a negative effect.

In the first column the number of imported varieties is insignificantly different from zero. Including the interaction term of *importdiv* with log GDP in column (2), increases the effect of *importdiv* to 1.9 while the interaction term is negative. Both variables are significant at the 1% level. The interpretation of this result is in line of the above constructed hypothesis. An increase in the number of imported varieties increases the government share. However, this increase is lower, the larger the country. In column (3) and (5), the shares of differentiated imports (the restrictive and liberal measure respectively) is included controlling for the love of variety. In both column it is negative and significant at the 5% and 10% level respectively. The negative sign is also in line with the theoretical model and the hypothesis mentioned above. Further, in columns (4) and (6) the interaction term of *importdiv* with $diff_r$ and $diff_l$ respectively is included. Against the hypothesis the interaction terms are negative. However, the coefficient of *importdiv* increases from 1.9 (2.1) to 4.4 (6.0) implying that there might be a problem of multicollinearity. Note that the interaction terms are highly correlated with the levels. In sum, the effect of an increase in *importdiv* is still positive.

[18] The correlation of some important variables for the early OECD sample are given in table 2.

[19] Note that since GDP and population enter in logs, controlling for log GDP per capita is redundant.

Table 4 shows the results with a full set of control variables. The results of the main measures of interest do not change much. Similar to the findings of others (e.g., Rodrik, 1998; Alesina and Wacziarg, 1998; Epifani and Gancia, 2009) *lagopenness* is significantly positive. The variables *polity*2, *depend* and *urban* are not significantly different from zero. The violence/war index (*war*) is positively correlated with the share of government consumption.

Table 3 and 4 report the baseline regression including OECD and non-OECD countries. However, the data quality within and between these two country groups may differ substantially. It is apparent from figure 2 that not only the pattern over time for the number of imported products is very different for the two country samples, but also that within group heterogeneity is much higher in the non-OECD sample. It might be sensible to look at the two country groups separately. Since the OECD country group is much more homogeneous and, on average, data is more reliable, the following analysis gives special weight to the OECD countries.

OECD

Table 5 reports a first set of regressions for the OECD sample according to equation (12) including some selected controls. In order to control for the jump in the trade data in 1984, time dummies are included in each regression. In column (1) to (5), the main measures of interest have the expected sign according to the hypothesis derived from the model. In column (7) *importdiv* gets negatively significant at the 5% level. In sum however, the effect of an increase in *importdiv* is still positive for the average country. Excluding *importdiv* (column (6) and (8)) does not alter the main message but reduces the problem of multicollinearity and lowers the standard errors. This is the case since the number of imported varieties is highly correlated with the number of differentiated imported varieties. As table 6 shows, the results of the variables in bold (except *loggdp*) are not robust and depend heavily on the chosen set of controls. Later on it is shown that, when fixed effects are different for the two periods, results stay more robust.

In contrast to the finding of many authors that trade openness (export plus import as a share of GDP) has a positive effect on government size, for the OECD countries this seems not to be the case. For OECD countries lagged openness is negatively significant at the 1% level.[20] Since in table 3 lagged openness is positive and in table 5 negative, the

[20]Rodrik (1998) already found the different pattern between richer and poorer countries. He argues

positive effect of *openness* on government size is driven by non-OECD countries.

How we should deal with the structural break in the explanatory variables is not that obvious. Including time dummies is clearly a necessary procedure. However, if the change in reporting trade is country specific, the country fixed effect in the early period differs from the one in the second period. The tables 7 and 8 report the results if we allow the country fixed effect to change between the two periods.[21] This procedure doubles the numbers of groups. A country's data before and after 1984 are considered as observations from two different countries. However, standard errors are clustered by country. An argument for a change in country fixed effects might be that censoring trade flows below \$100'000 affects small countries differently than large countries. Table 7 does not control for additional covariates. In contrast to table 6 *loggdp* is not significantly negative anymore. Column (2) in table 7 implies that an increase of import variety has a positive effect on government consumption for the average country.[22] However, for large countries the overall effect would be negative. In column (4), $diff_r$ and the interaction term $importdiv \times diff_r$ are included. *importdiv* gets insignificant and the interaction term is positive and highly significant. This means that the positive effect of imported varieties works especially if goods are differentiated. If the share of differentiated goods in the imported good basket increases, implying that love of variety increases, government consumption decreases. Columns (6) and (7) show the same specification as in (3) and (4) with $diff_l$ instead of $diff_r$. Columns (5) and (8) report the results excluding *importdiv* since the number of imported goods and the number of differentiated imported goods are highly correlated. If we compare column (4) with (5) and (7) with (8) it can be observed that the standard errors decrease fairly strongly. Generally it can be said that for the average country the number of imported products has a positive effect on the government share.

The estimation is quite robust with respect to the inclusion of further controls (table 8). Overall (except $diff_r$ in column (3)) the effects are slightly smaller but mostly keep

that the positive relation between trade openness and government spending is due to the external risk. According to Rodrik (1998) developed countries react with an increase in public employment and work programs, which is reflected in an increase in government consumption. However, developed countries have social welfare programs. Since social security is not included in the measure for government consumption from PWT, we should not necessarily find an effect there.

[21] Consider a fixed effects estimation of $y_{it} = \beta x_{it} + c_i + D_{84} + u_{it}$, where D_{84} is a dummy equal to zero for the first period and equal to one for the second period and c_i is a country fixed effect. It follows that $E(y_{it}|\beta x_{it}, c_i, D_{84}) = \beta x_{it} + c_i + D_{84}$. If a structural break in the explanatory variable x_{it} is country specific, D_{84} insufficiently accounts for the break in x_{it}. In order to account correctly for country specific breaks, the country fixed effects should be interacted with the period dummy.

[22] $\frac{\partial g}{\partial importdiv} = 12.824 - 0.638 \times loggdp$

their expected sign and do not lose significance. Quite the contrary, some even gain in significance (especially $diff_r$ and $diff_l$). In column (4) *importdiv* is still positively significant (at 5% level), despite the inclusion of the interaction term $importdiv \times diff_r$. It can be argued that since $diff_r$ does not take into account all differentiated products, there are still differentiated products captured in *importdiv*. In column (8) *importdiv* gets negatively significant, correcting somehow for what $importdiv \times diff_l$ overstates the effect of differentiated imported varieties. The interaction terms are very interesting from a theoretical point of view. Empirically, however, it incorporates some problems of multicollinearity.[23] In order to reduce the problem of multicollinearity columns (5), (6), (9) and (10) exclude *importdiv*. The estimation of the number of differentiated imported varieties in column (5) is much higher than the coefficient for *importdiv* in column (3). Interestingly, controlling for *lagopenness* (compare (5) with (6) and (9) with (10)) increases the estimations of the variables in bold and reduces their standard errors. Comparing the interaction term $importdiv \times loggdp$ and $diff$ in table 6 with tables 7 and 8, the specification which allows fixed effects to be different for the two periods yields much more robust results with respect to the inclusion of controls.

The results so far are quite convincing that the LOVE exists in the data. Nevertheless, the sources of trade data for the two periods are different and low valued trade flows below $100'000 are not reported in the later period. In the early sample no censoring has taken place. A closer look on the early sample seems appropriate. Table 9 and 10 provide estimation results for the OECD sample and the period from 1964 to 1983. In table 9 results without further controls are shown. The estimated coefficients are quite similar to the regression in table 7. The results are robust with respect to further controls as it can be seen in table 10. While in column (3) *importdiv* is significant at the 5% level, in column (7) *importdiv* is not significant. We may argue that the interaction term $importdiv \times diff_r$ does not capture all differentiated products and therefore *importdiv* stays significant. Since $diff_l$ is a less restrictive measure of differentiated products, $importdiv \times diff_l$ captures a broader set of differentiated imports. According to column (3) the effect of *importdiv* on the share of government consumption is positive for the average country and equal to 2.21.[24] As g is in logs, an increase in *importdiv* of 1

[23] We should always have in mind, that multicollinearity between the explanatory variables is large. Especially between *importdiv* and $importdiv \times diff$ which is 0.97 and between *importdiv* and $importdiv \times loggdp$ which is 0.95.

[24] $\frac{\partial g}{\partial importdiv} = 5.493 - 0.532 \times loggdp + 13.308 \times diff_r = 2.21$ if $loggdp = 18.93$ and $diff_r = 0.51$.

percentage point (say from from 0.5 to 0.51) - which is an increase of approximately 11 new imported products - implies that the government share increases by 2.2 percent.

As column (4) and (8) show, the inclusion of additional controls (the diversity of exports (*exportdiv*) and the volume of imports (*imports*)) does not change sign and significance of the coefficients of interest. Both variables could potentially be correlated with government size and number of imported products.[25] When a country's production is concentrated on a few industries (this might be reflected in a smaller range of exported products) the range of imported goods may be larger. Further, the number of imported varieties and the volume of imports are positively correlated, the effect of import diversity on government spending could just capture the effect of higher import volumes. Accounting for import volume (*imports*) indicates that this concern is unfounded.

I already mentioned that multicollinearity is an issue we have to be concerned about. Although in the early OECD sample multicollinearity is less severe than in the other samples, $importdiv \times diff_r$ and *importdiv* are highly correlated. The interaction term $importdiv \times diff_r$ is nothing else than the number of differentiated imported goods. So far both terms have been included in order to show that the number of differentiated imported goods are more important than the number of all imported goods. Table 11 provides the results with the number of differentiated imported goods ($importdiv \times diff_r$) instead of *importdiv*. Results show that without the interaction term $importdiv \times gdp$ the effect of the number of differentiated imported goods is positive but only weakly significant when we do not control for *lagopenness* (column 1). Introducing *lagopenness* as a further control reduces the effect of the number of differentiated imported products which is still positive but not significant (column (2)). A robust result is that a high love of variety ($diff_r$) reduces the share of government consumption. In column 3, the interaction term $importdiv \times gdp$ is significantly negative while the number of differentiated imported goods is positive and highly significant. The positive effect of additional imported goods is decreasing in home market size.

Results for the late OECD sample are provided in table 12. Columns (1) to (4) indicate that the number of imported varieties has a positive effect on the government share (*importdiv* and $importdiv \times diff$ are positively significant). Moreover, the effect is stronger if the imported goods are differentiated. The first four columns also show that

[25] Cameron (1978) argues that countries where production is concentrated on few industries are stronger hidden by an external shock. When government provides insurance against these risk, the government share is larger when industries are concentrated.

the government share decreases in home market size (*loggdp*). Columns (5) to (7) test the other hypothesis. However, the estimated coefficients and standard errors are quite large which is probably the result of the high collinearity between the levels and interaction terms.

Non-OECD

Finally, the non-OECD country sample is examined. The data among non-OECD countries is much more volatile. Separate regressions for the two time periods leads to insignificant estimators.[26] The number of observations is too low for the degree of volatility. Therefore, only results for the whole time span are reported. Analog to the OECD sample the first regression shows results with constant country fixed effects (table 13) and the second allows the country fixed effects to be different between the two periods (table 14). According to table 13 the number of imported goods has a positive effect on the share of government consumption and the effect is decreasing in country size. In the first column of table 14 *importdiv* is significant at the 5% level implying that the government share for countries with a broader set of imported goods is larger. In column (7) the coefficient on the number of differentiated imported products is higher than in column (1) on *importdiv*. This indicates that the effect of imported goods is stronger if they are differentiated. In column (8) the coefficient gets closer to the one in column (1) as the liberal measure comprises a broader set of goods (including less differentiated ones) than the restrictive measure. In the other columns the signs of the coefficients on the variables of interests are "correct", however, not significant. This is most probably a result of the high collinearity between the levels and their interaction terms.

5 Robustness

The results so far indicate that the love of variety effect on government consumption may exist. In order to minimize the possibility that the findings above are a coincidence and a consequence of certain specifications, this section presents various robustness checks for the early OECD sample.

[26] Results not reported.

Log specification

Whether one should logarithmize or not is often a difficult question. We should be aware that with taking logs some functional form is imposed and results may depend upon taking logs. For instance, Rodrik (1998) logarithmized all shares and found a positive relationship between lagged openness and government consumption. Alesina and Wacziarg (1998) replicated Rodrik's regression with and without logarithmized government share and with a more or less similar country sample. They find that openness is significantly positive with log ratios, however it is not significant in levels. My motivation of using log government shares comes from the symmetric Nash equilibrium of the governments. Solving equation (7) for two symmetric countries ($\bar{L}_H = \bar{L}_F$), the shares in both countries is identical and equal to

$$g = \frac{1-\eta}{1+\eta\frac{1-\nu}{\nu}(1-\tau/2)} \, .$$

Taking logs of both sides we obtain

$$\log g = \log(1-\eta) - \log(1+\eta\frac{1-\nu}{\nu}(1-\tau/2))$$

For realistic values of the elasticity of substitution ($\sigma > 2$, i.e. $\nu > 0.5$) the expression ($\eta\frac{1-\nu}{\nu}(1-\tau/2)$) is small and therefore, the following equation holds approximately:

$$\log g \approx \log(1-\eta) - \eta\frac{1-\nu}{\nu} + \eta\frac{1-\nu}{\nu}\tau/2$$

.

However, in view of the different findings depending on taking logs mentioned above, it is reasonable to check for robustness of this specification. Table 15 provides the results and confirms that the log specification does not drive the results. If we compare the estimations for the variables in bold, they keep their expected sign and are highly significant. Note however, that the coefficient of lagged openness is now insignificantly different from zero while it is significantly negative under the log specification.

Dynamic panel estimation

One may argue that the share of government consumption reacts rather slowly on changes in the economic environment and therefore past realizations of the dependent variable may affect its current level. In order to capture this persistence a lagged value of government

consumption is included on the right-hand side of the estimation equation.[27] Table 16 shows the results with one-step Arellano and Bond's GMM estimator for the early OECD sample, one lag of government share on the right hand side and first differences in the other variables. It is corrected for heteroskedasticity in the error terms by robust standard errors.[28] This method assumes that there is no second-order autocorrelation in the first-differenced errors. The null hypothesis of first and second order autocorrelation in the error terms is rejected. The results show some persistence in government consumption. The coefficient on lagged government share is around 0.3 and significant at the 5% level. Nevertheless, the estimations of the main measures are strongly robust and do not lose their significance. Note, however, that in contrast to table 9 *lagopenness* has lost its significance.

Alternative measure for importdiv

Further, an objection might be that only counting the number of different products imported from the rest of the world is biased towards counting too few products. There might be also gains from consuming both German and Italian cars. An alternative to the *importdiv* measure used so far is to distinguish between the countries of origin as well. Column (1) to (3) in table 17 show the results with this alternative measure which counts a good manifold if classified as differentiated by Rauch (1999). For example, the product category "passenger motor cars, for transport of passengers and goods" is classified as differentiated. If a country imports cars from Germany and Italy, the product category "passenger motor cars, for transport of passengers and goods" is counted twice. Finally this new measure is logarithmized.[29] Hence, the coefficient on *importdiv* can be interpreted as an elasticity. According to column (1) a 1% increase in imported varieties implies a 0.1% increase in the share of government consumption for the average country. For the smallest country in the sample, a 1% increase in imported varieties would even increase the share of government consumption by approximately 0.5%. Since this new measure already accounts for differentiated goods, the interaction term $importdiv \times diff$

[27] In order not to loose observations through the introduction of the lag, the first observation for government consumption is the average of 1960-1963.

[28] The instruments seem to be valid as the null of Sargan test of the one-step homoskedastic estimation is not rejected.

[29] The mean of this new measure is equal to 8.36, standard deviation is 0.51, min and max are equal to 6.88 and 9.36 respectively (these figures are for the OECD sample and the early period).

is, due to a multicollinearity problem, not included in the regression.[30]

Alternative measure for diff

Using the share of differentiated imports is one alternative to proxy the love of variety. According to Dixit-Stiglitz, the love of variety is inversely related to the elasticity of substitution. Since there is literature providing estimations of the elasticity of substitution (see Broda and Weinstein, 2006), we may take use of them. Consider the following inverse of a weighted elasticity of substitution:

$$lov_{it} = \left(s_{it}^{d} \sigma^{d} + s_{it}^{r} \sigma^{r} + (1 - s_{it}^{d} - s_{it}^{r}) \sigma^{h} \right)^{-1}$$

where s_{it}^{d} (σ^{d}) denotes the share (elasticity) of differentiated goods and s_{it}^{r} (σ^{r}) the share (elasticity) of reference priced goods and σ^{h} the elasticity of homogeneous goods. For the elasticity of substitution, the average of the two periods provided in table 18 is taken, that is $\sigma^{d} = 4.95$, $\sigma^{r} = 6.85$ and $\sigma^{h} = 13.45$. As we would expect, the correlations between the two $diff$ measures and lov are very high: $corr(lov, diff_{r}) = 0.91$ and $corr(lov, diff_{l}) = 0.89$.

The regression results for this alternative proxy for the love of variety are found in table 17 column (4). Again, the results are extremely robust. While *importdiv* is not significantly different from zero, its interaction term with *loggdp* is negatively significant and its interaction term with *lov* is positively significant. The new proxy *lov* itself is negatively significant.

Yearly data

In order to exclude the possibility that the results depend on averaging the data, the last three columns in table 17 provide the results with yearly data including all controls. Concerning the significance the results are extremely robust. However, the magnitude of the estimated effects differs slightly if we compare them with the results in table 9.[31]

[30] If the interaction term $importdiv \times diff$ is included, the estimations of the main variables of interest (in bold) become insignificant.

[31] Results (not reported) are robust if I take only every 4 years. This is suggested by Acemoglu et al. (2008) who prefer to take every 5 years to averaging over 5 years since averaging introduces additional serial correlation.

6 Conclusion

The possibility of open countries to export costs of public good provision to foreign countries through the terms of trade effect is well known. Empirical evidence indicates that this channel exists and that open countries have bigger governments because of the terms of trade externality.

Accounting for differentiated goods, love of variety and endogenous firm entry, the other side of the coin is the possibility to export costs of public good provision through the variety effect. If the crowding out of firms are important costs of public good provision, access to a broad range of foreign products dampens national costs of public good provision. This paper provided empirical evidence for this theoretically intuitive channel - referred to as the love of variety effect on government spending.

The main focus of the empirical analysis lies on the OECD country sample and the time span 1964-1983 where trade data are not censored. For this sample the results are very robust. The number of imported varieties has a positive effect on the share of the public sector. This positive effect is mainly driven by goods classified as differentiated. Intuitively this is what we would expect, since the gains from new imported goods are larger when goods are differentiated. Further, I find that the positive effect of imported varieties decreases in country size. The intuition behind this finding is that national costs of public good provision in large countries are dampened relatively less. Last but not least the share of differentiated on total imported products is negatively correlated with the government share. The share of differentiated imported products is taken as an indicator for love of variety. National costs of public good provision are large if love of variety is high since crowding out of domestic varieties "hurts" more.

To conclude, the results show that OECD countries fit quite well the theoretical framework and that they take advantage of the LOVE. Moreover, some weak evidence is also found for non-OECD countries that they increase government spending when the number of imported goods rises. Hence, this paper provides further empirical support that fiscal externalities due to trade liberalization leads to larger governments. Fiscal cooperation would be necessary to reduce government spending and achieve higher global welfare.

The intention of the paper is not to discriminate between the terms of trade effect and the love of variety effect. By focusing on the extensive margin of imports, this paper provides first evidence that government expansion reacts positively on the number of im-

ported goods and a high love of variety induces governments to reduce their expenditures. The obtained results show that the LOVE is not negligible. In order to obtain insights on the relative importance of the two effects, the TOTE versus the LOVE, further analysis on the "openness and government size"-issue should distinguish between the intensive and extensive margin of imports (and discriminate between developing and developed countries).

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A Appendix

Figure 1: Sample means of government consumption as a share of GDP

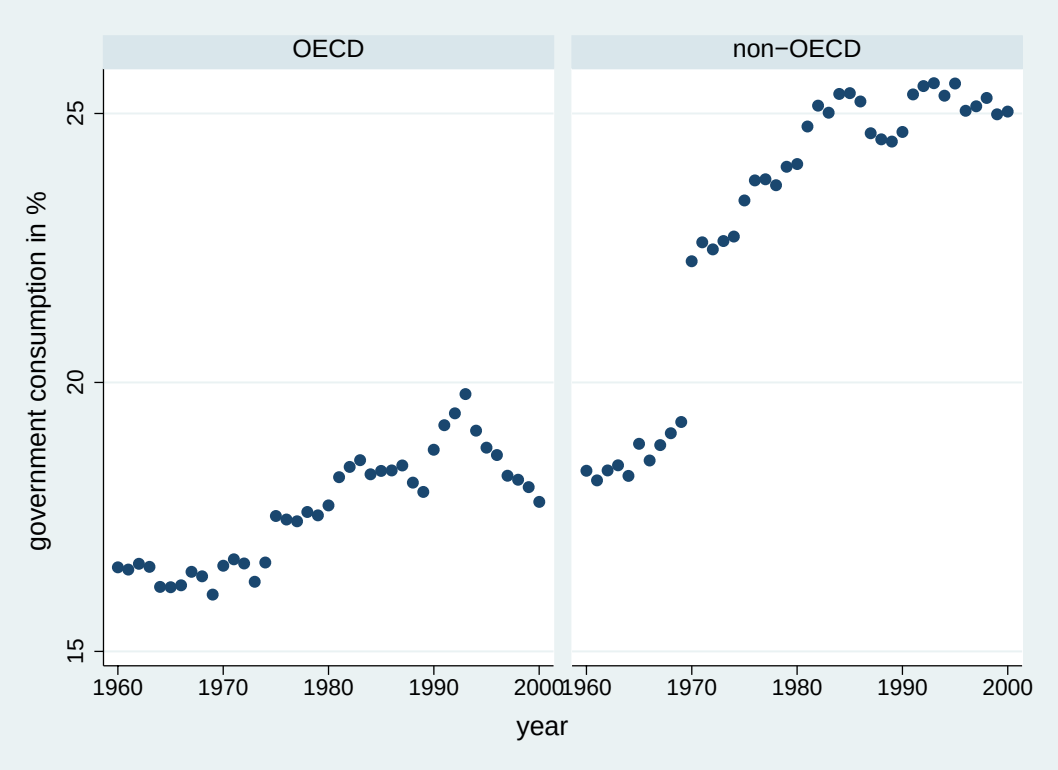
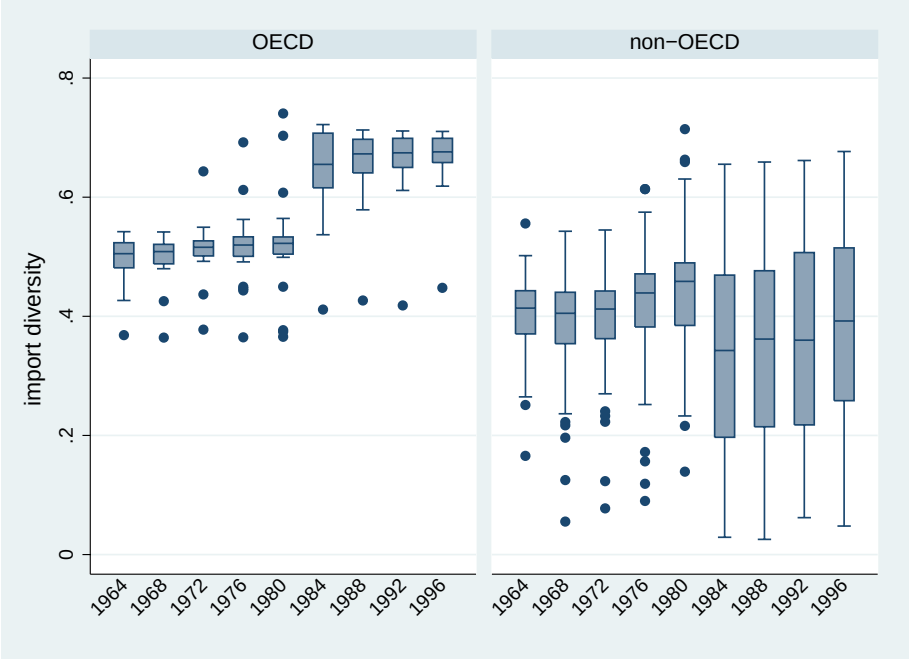


Figure 2: Distribution of *impordiv*



Notes: 1964 refers to the time period 1964-1967, 1968 to 1968-1971 and so on. 50% of the distribution are within the box, the whiskers and adjacent lines comprise the lower and upper adjacent value and the data points are outlayers. The lowest outlayers within the OECD sample are Turkey (1964 to 1983) and Iceland (1984 to 2000).

Figure 3: Distribution of $diff_r$ and $diff_l$

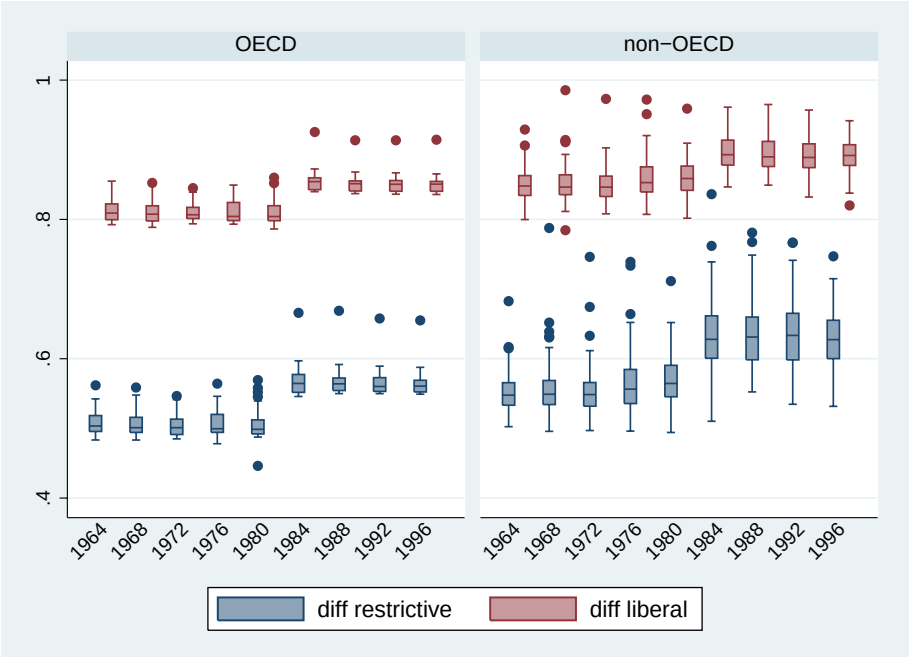


Table 1: Sample descriptive statistics

		OECD		non-OECD	
		<1984	≥1984	<1984	≥1984
g	mean (std)	2.80 (0.27)	2.89 (0.29)	2.96 (0.49)	3.08 (0.46)
	[min,max]	[1.95,3.44]	[2.04,3.57]	[1.60,4.23]	[1.38,4.35]
importdiv	mean (std)	0.51 (0.05)	0.66 (0.06)	0.41 (0.09)	0.36 (0.16)
	[min,max]	[0.36,0.74]	[0.41,0.72]	[0.06,0.71]	[0.03,0.68]
diff_r	mean (std)	0.51 (0.02)	0.57 (0.02)	0.56 (0.04)	0.63 (0.05)
	[min,max]	[0.45,0.57]	[0.55,0.67]	[0.49,0.79]	[0.51,0.84]
diff_l	mean (std)	0.81 (0.02)	0.85 (0.02)	0.85 (0.03)	0.89 (0.02)
	[min,max]	[0.79,0.86]	[0.84,0.93]	[0.78,0.99]	[0.82,0.97]
loggdp	mean (std)	18.93 (1.43)	19.42 (1.43)	16.30 (1.70)	16.69 (1.78)
	[min,max]	[14.56,22.36]	[15.42,22.92]	[11.26,20.72]	[11.28, 21.57]
logpop	mean (std)	9.60 (1.42)	9.74 (1.41)	8.40 (1.83)	8.65 (1.81)
	[min,max]	[5.26,12.37]	[5.49,12.54]	[3.78,13.82]	[3.67,13.79]
polity2	mean (std)	6.35 (6.47)	8.48 (3.72)	-3.49 (6.29)	-0.52 (6.52)
	[min,max]	[-9,10]	[-7,10]	[-10,10]	[-10,10]
depend	mean (std)	0.60 (0.11)	0.51 (0.06)	0.86 (0.14)	0.77 (0.18)
	[min,max]	[0.46,1.03]	[0.40,0.84]	[0.42,1.15]	[0.38,1.17]
urban	mean (std)	67.69 (16.58)	73.40 (12.56)	37.33 (23.54)	46.19 (23.67)
	[min,max]	[24.13,95.61]	[38.20,97.19]	[2.31,100]	[5.04,100]
war	mean (std)	0.22 (0.68)	0.18 (0.67)	0.93 (1.93)	1.23 (2.30)
	[min,max]	[0.00,3.75]	[0.00,4.00]	[0.00,14.00	[0.00,14.00]
lagopenness	mean (std)	3.33 (0.63)	3.76 (0.54)	3.95 (0.76)	4.09 (0.72)
	[min,max]	(1.73,4.66)	[2.52,4.93]	[1.95,6.41]	[1.42,6.44]

Table 2: Correlations: OECD, <1984

	importdiv	diff_r	diff_l	loggdp	importdiv×diff_r
diff_r	-0.1905				
diff_l	-0.24	0.94			
loggdp	0.47	-0.32	-0.45		
importdiv×diff_r	0.94	0.15	0.08	0.37	
importdiv×loggdp	0.91	-0.24	-0.34	0.79	0.84

Table 3: All countries: 1964-2000

	(1)	(2)	(3)	(4)	(5)	(6)
importdiv	0.163	1.934***	1.941***	4.366***	2.145***	6.040***
	(0.115)	(0.642)	(0.638)	(1.208)	(0.641)	(2.251)
importdiv×loggdp		-0.106***	-0.111***	-0.139***	-0.117***	-0.135***
		(0.038)	(0.038)	(0.039)	(0.037)	(0.039)
diff$_r$			-0.775**	0.047		
			(0.322)	(0.443)		
importdiv×diff$_r$				-3.121**		
				(1.339)		
diff$_l$					-0.797*	0.444
					(0.464)	(0.813)
importdiv×diff$_l$						-4.019*
						(2.219)
loggdp	-0.201***	-0.162***	-0.156***	-0.153***	-0.160***	-0.163***
	(0.042)	(0.044)	(0.044)	(0.044)	(0.044)	(0.044)
logpop	0.262***	0.248***	0.254***	0.250***	0.253***	0.253***
	(0.072)	(0.073)	(0.073)	(0.074)	(0.073)	(0.073)
oecd×after84	0.032	0.063*	0.074**	0.073**	0.066*	0.062*
	(0.033)	(0.034)	(0.035)	(0.035)	(0.034)	(0.035)
Time Dummies	yes	yes	yes	yes	yes	yes
# Obs.	1150	1150	1150	1150	1150	1150
# countries	156	156	156	156	156	156
R^2	0.141	0.148	0.154	0.159	0.151	0.154

Notes: Robust standard errors in parentheses.
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 4: All countries: 1964-2000

	(1)	(2)	(3)	(4)	(5)	(6)
importdiv	0.155	2.727***	2.566***	5.940***	2.743***	9.129***
	(0.132)	(0.848)	(0.862)	(1.582)	(0.840)	(2.887)
importdiv×loggdp		-0.151***	-0.145***	-0.191***	-0.152***	-0.190***
		(0.049)	(0.049)	(0.053)	(0.048)	(0.052)
diff$_r$			-0.651*	0.441		
			(0.361)	(0.478)		
importdiv×diff$_r$				-4.078***		
				(1.546)		
diff$_l$					-0.084	1.974**
					(0.521)	(0.961)
importdiv×diff$_l$						-6.372**
						(2.642)
loggdp	-0.229***	-0.172***	-0.165***	-0.162***	-0.172***	-0.180***
	(0.053)	(0.054)	(0.055)	(0.054)	(0.054)	(0.053)
logpop	0.328***	0.307***	0.305***	0.296***	0.307***	0.302***
	(0.097)	(0.098)	(0.098)	(0.099)	(0.098)	(0.100)
oecd×after84	0.005	0.047	0.049	0.047	0.047	0.038
	(0.038)	(0.038)	(0.038)	(0.038)	(0.038)	(0.039)
depend	-0.169	-0.178	-0.129	-0.152	-0.175	-0.211*
	(0.126)	(0.125)	(0.128)	(0.127)	(0.126)	(0.126)
polity2	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
urban	-0.003	-0.003	-0.003	-0.002	-0.003	-0.003
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
war	0.016***	0.016***	0.016***	0.015***	0.016***	0.015***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
lagopenness	0.095***	0.099***	0.095***	0.080***	0.099***	0.086***
	(0.028)	(0.028)	(0.028)	(0.029)	(0.029)	(0.030)
Time Dummies	yes	yes	yes	yes	yes	yes
# Obs.	987	987	987	987	987	987
# countries	140	140	140	140	140	140
R^2	0.176	0.186	0.191	0.198	0.186	0.193

Notes: Robust standard errors in parentheses.
* significant at 10%; ** significant at 5%; *** significant at 1%.

Table 5: OECD, 1964-2000

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
importdiv	0.009	4.236***	4.475***	-1.929	-0.590		-10.640**	
	(0.240)	(1.504)	(1.494)	(1.978)	(1.932)		(4.888)	
importdiv×**loggdp**		-0.209***	-0.215***	-0.192**	-0.232***	-0.238***	-0.177***	-0.233***
		(0.077)	(0.077)	(0.074)	(0.073)	(0.063)	(0.067)	(0.065)
diff$_r$			-0.661	-6.135***	-5.897***	-5.484***		
			(0.575)	(1.664)	(1.718)	(1.392)		
importdiv×**diff**$_r$				10.913***	9.988***	9.143***		
				(3.071)	(3.022)	(2.306)		
diff$_l$							-10.685***	-4.617***
							(3.479)	(1.265)
importdiv×**diff**$_l$							17.269***	5.867***
							(5.762)	(1.560)
loggdp	-0.376***	-0.246***	-0.242***	-0.248***	-0.163*	-0.159**	-0.191**	-0.163**
	(0.055)	(0.079)	(0.079)	(0.078)	(0.084)	(0.080)	(0.081)	(0.080)
logpop	0.818***	0.807***	0.780***	0.763***	0.642***	0.641***	0.578***	0.610***
	(0.146)	(0.137)	(0.128)	(0.124)	(0.129)	(0.128)	(0.135)	(0.130)
polity2	0.012***	0.011***	0.011***	0.011***	0.013***	0.013***	0.013***	0.012***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
depend	0.498***	0.541***	0.572***	0.551***	0.412**	0.415**	0.407**	0.419**
	(0.169)	(0.167)	(0.172)	(0.170)	(0.165)	(0.164)	(0.163)	(0.164)
lagopenness					-0.145***	-0.146***	-0.144***	-0.154***
					(0.045)	(0.044)	(0.046)	(0.045)
Time Dummies	yes	yes	yes	yes	yes	yes	yes	yes
# Obs.	234	234	234	234	229	229	229	229
# countries	28	28	28	28	28	28	28	28
R^2	0.480	0.515	0.518	0.533	0.584	0.584	0.590	0.583

Notes: Robust standard errors in parentheses.
* significant at 10%; ** significant at 5%; *** significant at 1%.

Table 6: OECD, 1964-2000

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
importdiv	4.573*		-4.698**		-3.240*		7.138		-10.630***	
	(2.336)		(1.831)		(1.800)		(4.458)		(3.613)	
importdiv×loggdp	-0.250***	-0.192***	0.013	-0.044	-0.015	-0.055	-0.263***	-0.221***	0.015	-0.042
	(0.079)	(0.068)	(0.066)	(0.053)	(0.068)	(0.054)	(0.080)	(0.075)	(0.064)	(0.060)
diff$_r$	0.681	-2.004*	-4.275***	-1.135	-3.662***	-1.512				
	(1.604)	(1.179)	(1.314)	(1.274)	(1.280)	(1.282)				
importdiv×diff$_r$	0.082	6.134***	8.449***	1.976	6.842***	2.397				
	(3.374)	(2.358)	(2.388)	(1.967)	(2.306)	(1.983)				
diff$_l$							1.547	-2.062*	-6.976***	-0.951
							(2.555)	(1.134)	(2.453)	(1.203)
importdiv×diff$_l$							-2.639	4.763***	12.577***	1.218
							(4.983)	(1.739)	(4.124)	(1.432)
loggdp	-0.257**	-0.280***	-0.566***	-0.534***	-0.503***	-0.477***	-0.254**	-0.265**	-0.517***	-0.490***
	(0.103)	(0.098)	(0.072)	(0.067)	(0.074)	(0.067)	(0.105)	(0.103)	(0.073)	(0.070)
logpop	0.693***	0.716***	0.670***	0.684***	0.516***	0.522***	0.674***	0.675***	0.487***	0.522***
	(0.142)	(0.142)	(0.120)	(0.120)	(0.114)	(0.112)	(0.144)	(0.143)	(0.115)	(0.112)
depend			0.548***	0.580***	0.379***	0.397***			0.378***	0.393***
			(0.158)	(0.158)	(0.142)	(0.141)			(0.142)	(0.144)
polity2			0.009***	0.008***	0.010***	0.009***			0.010***	0.009***
			(0.002)	(0.002)	(0.002)	(0.002)			(0.002)	(0.002)
urban			0.011***	0.011***	0.012***	0.012***			0.012***	0.013***
			(0.002)	(0.002)	(0.001)	(0.001)			(0.001)	(0.001)
war			0.052***	0.048***	0.052***	0.049***			0.051**	0.049**
			(0.020)	(0.018)	(0.020)	(0.018)			(0.020)	(0.020)
lagopenness					-0.169***	-0.175***			-0.165***	-0.175***
					(0.038)	(0.037)			(0.038)	(0.037)
Time Dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
# Obs.	243	243	234	234	229	229	243	243	229	229
# countries	29	29	28	28	28	28	29	29	28	28
R^2	0.389	0.382	0.638	0.632	0.705	0.702	0.384	0.380	0.707	0.700

Notes: Robust standard errors in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%.

Table 7: OECD, 1964-2000
Country fixed effects are allowed to be different for the two periods

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
importdiv	-0.106	12.824***	11.818***	5.356		10.475**	-9.226	
	(0.537)	(3.705)	(3.680)	(3.902)		(3.975)	(5.629)	
importdiv×**loggdp**		-0.638***	-0.575***	-0.650***	-0.530***	-0.507**	-0.475***	-0.566***
		(0.175)	(0.176)	(0.150)	(0.097)	(0.192)	(0.154)	(0.139)
diff$_r$			-1.383	-7.864***	-10.470***			
			(0.904)	(1.782)	(1.887)			
importdiv×**diff**$_r$				14.444***	19.741***			
				(4.221)	(3.608)			
diff$_l$						-2.146*	-13.627***	-8.863***
						(1.181)	(2.338)	(1.460)
importdiv×**diff**$_l$							22.724***	13.881***
							(5.162)	(3.446)
loggdp	-0.245*	0.027	-0.012	0.039	-0.005	-0.064	-0.055	-0.021
	(0.121)	(0.145)	(0.158)	(0.136)	(0.117)	(0.176)	(0.148)	(0.152)
Time Dummies	yes	yes	yes	yes	yes	yes	yes	yes
# Obs.	243	243	243	243	243	243	243	243
# groups	55	55	55	55	55	55	55	55
R^2	0.281	0.409	0.422	0.460	0.448	0.425	0.473	0.464

Notes: Robust standard errors clustered by countries in parentheses. Fixed effects interacted with period.
* significant at 10%; ** significant at 5%; *** significant at 1%.

Table 8: OECD, 1964-2000
Country fixed effects are allowed to be different for the two periods

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
importdiv	-0.221	8.826***	8.000***	4.740**			6.882**	-6.149**		
	(0.234)	(2.674)	(2.146)	(2.013)			(2.558)	(2.964)		
importdiv×loggdp		-0.452***	-0.391***	-0.508***	-0.361***	-0.269***	-0.340**	-0.373***	-0.440***	-0.318**
		(0.127)	(0.104)	(0.077)	(0.044)	(0.086)	(0.125)	(0.072)	(0.076)	(0.140)
diff$_r$			-1.570***	-6.378***	-8.067***	-6.662***				
			(0.503)	(0.805)	(0.926)	(1.917)				
importdiv×diff$_r$				10.336***	13.646***	10.449***				
				(2.081)	(1.562)	(3.279)				
diff$_l$							-1.736*	-10.309***	-7.059***	-6.514***
							(0.929)	(1.385)	(1.028)	(1.392)
importdiv×diff$_l$								16.491***	10.654***	7.972**
								(3.083)	(1.775)	(3.338)
loggdp	-0.384***	-0.138	-0.153*	-0.055	-0.122	-0.246**	-0.199*	-0.138	-0.118	-0.248*
	(0.085)	(0.103)	(0.088)	(0.086)	(0.089)	(0.096)	(0.115)	(0.094)	(0.102)	(0.127)
logpop	0.455**	0.433**	0.359*	0.230	0.196	0.522**	0.384*	0.232	0.287	0.565**
	(0.211)	(0.210)	(0.186)	(0.184)	(0.185)	(0.208)	(0.193)	(0.185)	(0.178)	(0.208)
depend	0.131	0.165	0.280	0.250	0.231	0.616*	0.250	0.265	0.257	0.651*
	(0.290)	(0.252)	(0.248)	(0.234)	(0.241)	(0.310)	(0.274)	(0.257)	(0.258)	(0.327)
polity2	0.008***	0.008***	0.008***	0.008***	0.008***	0.007**	0.008***	0.008***	0.008***	0.007**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)	(0.003)
urban	0.012***	0.010***	0.010***	0.009***	0.009***	0.007**	0.010***	0.009***	0.009***	0.007**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)	(0.003)
war	0.032*	0.004	0.006	0.005	0.015	0.018	0.005	0.005	0.001	0.004
	(0.018)	(0.012)	(0.011)	(0.012)	(0.012)	(0.015)	(0.012)	(0.013)	(0.012)	(0.014)
lagopenness	-0.200***	-0.210***	-0.220***	-0.226***	-0.225***		-0.211***	-0.214***	-0.214***	
	(0.051)	(0.055)	(0.043)	(0.036)	(0.034)		(0.047)	(0.037)	(0.041)	
Time Dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
# Obs.	229	229	229	229	229	234	229	229	229	234
# groups	53	53	53	53	53	53	53	53	53	53
R^2	0.653	0.689	0.703	0.719	0.712	0.597	0.698	0.719	0.716	0.608

Notes: Robust standard errors in parentheses.
* significant at 10%; ** significant at 5%; *** significant at 1%.

Table 9: OECD, 1964-1983

	(1)	(2)	(3)	(4)	(5)	(6)
importdiv	-0.337	13.827***	12.733***	6.521**	10.492**	-9.202*
	(0.402)	(3.174)	(2.981)	(2.524)	(4.163)	(5.025)
importdiv×**loggdp**		-0.688***	-0.619***	-0.866***	-0.507**	-0.634***
		(0.144)	(0.140)	(0.129)	(0.203)	(0.166)
diff$_r$			-1.539	-10.247***		
			(0.963)	(1.891)		
importdiv×**diff**$_r$				20.364***		
				(4.790)		
diff$_l$					-2.382	-15.016***
					(1.563)	(3.153)
importdiv×**diff**$_l$						26.536***
						(6.774)
loggdp	-0.157	0.005	-0.025	0.059	-0.073	-0.035
	(0.130)	(0.133)	(0.138)	(0.115)	(0.143)	(0.123)
Time Dummies	yes	yes	yes	yes	yes	yes
# Obs.	132	132	132	132	132	132
# countries	27	27	27	27	27	27
R^2	0.279	0.426	0.444	0.514	0.445	0.515

Notes: Robust standard errors in parentheses.
* significant at 10%; ** significant at 5%; *** significant at 1%.

Table 10: OECD, 1964-1983

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
importdiv	6.895***	7.546***	5.493**	11.570***	-3.442	-4.516	-4.968	-3.226
	(2.366)	(2.709)	(2.585)	(3.795)	(5.140)	(4.328)	(3.818)	(8.186)
importdiv×loggdp	-0.757***	-0.647***	-0.532***	-0.923***	-0.598***	-0.426***	-0.328**	-0.659***
	(0.120)	(0.135)	(0.134)	(0.165)	(0.154)	(0.159)	(0.145)	(0.216)
diff$_r$	-7.155***	-6.503***	-6.408***	-7.461***				
	(1.778)	(1.580)	(1.157)	(2.587)				
importdiv×diffr	14.931***	10.578***	9.863***	13.308***				
	(4.280)	(3.403)	(2.673)	(4.055)				
diff$_l$					-10.103***	-10.798***	-9.785***	-12.475***
					(3.282)	(2.556)	(2.123)	(4.402)
importdiv*diff$_l$					18.360***	16.099***	14.069***	20.090***
					(6.508)	(4.686)	(4.106)	(6.654)
loggdp	-0.094	-0.196	-0.041	0.236	-0.151	-0.296**	-0.152	0.114
	(0.138)	(0.125)	(0.120)	(0.151)	(0.139)	(0.130)	(0.123)	(0.178)
logpop	0.595**	0.729***	0.257	0.227	0.564**	0.677***	0.262	0.220
	(0.250)	(0.229)	(0.193)	(0.238)	(0.268)	(0.228)	(0.195)	(0.236)
depend		0.568**	0.285	0.078		0.589**	0.298	0.109
		(0.225)	(0.204)	(0.229)		(0.230)	(0.216)	(0.238)
polity2		0.011***	0.008***	0.009***		0.011***	0.008***	0.008***
		(0.003)	(0.002)	(0.002)		(0.003)	(0.002)	(0.002)
urban		0.005	0.010***	0.010***		0.005	0.011***	0.010***
		(0.004)	(0.002)	(0.003)		(0.004)	(0.002)	(0.003)
war		-0.003	-0.002	-0.037**		0.000	0.000	-0.031**
		(0.020)	(0.020)	(0.015)		(0.021)	(0.022)	(0.015)
lagopenness			-0.263***				-0.251***	
			(0.041)				(0.041)	
exportdiv				-0.377				-0.463*
				(0.231)				(0.236)
imports				-0.188**				-0.187**
				(0.080)				(0.077)
# Obs.	132	127	124	113	132	127	124	113
# countries	27	26	26	23	27	26	26	23
R^2	0.552	0.730	0.823	0.780	0.548	0.736	0.822	0.786

Notes: Robust standard errors in parentheses.
* significant at 10%; ** significant at 5%; *** significant at 1%.

Table 11: OECD, 1964-1983

	(1)	(2)	(3)
importdiv×**diff**$_r$	1.007*	0.673	12.820***
	(0.604)	(0.467)	(2.657)
diff$_r$	-3.091***	-3.018***	-7.996***
	(0.914)	(0.694)	(1.276)
importdiv×**loggdp**			-0.337***
			(0.074)
loggdp	-0.479***	-0.263**	-0.097
	(0.115)	(0.124)	(0.121)
logpop	0.734***	0.252	0.159
	(0.236)	(0.189)	(0.178)
depend	0.562**	0.281	0.201
	(0.234)	(0.209)	(0.204)
polity2	0.011***	0.008***	0.008***
	(0.003)	(0.002)	(0.002)
urban	0.007	0.013***	0.011***
	(0.004)	(0.002)	(0.002)
war	0.038**	0.030**	0.013
	(0.019)	(0.015)	(0.015)
lagopenness		-0.281***	-0.277***
		(0.042)	(0.040)
Time Dummies	yes	yes	yes
# Obs.	127	124	124
# countries	26	26	26
R^2	0.678	0.786	0.811

Notes: Robust standard errors in parentheses.
* significant at 10%; ** significant at 5%; *** significant at 1%.

Table 12: OECD, 1984-2000

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
importdiv	1.047**		0.944*		-13.705	-13.626	21.114
	(0.418)		(0.549)		(19.436)	(19.754)	(35.156)
importdiv×**loggdp**					0.766	0.763	0.403
					(1.013)	(1.030)	(1.005)
diff$_r$						0.857	32.192
						(1.331)	(29.632)
importdiv×**diff**$_r$		1.832***		1.632**			-48.953
		(0.667)		(0.776)			(46.701)
loggdp	-0.387***	-0.377***	-0.451***	-0.435***	-0.972	-0.957	-0.717
	(0.101)	(0.099)	(0.077)	(0.077)	(0.715)	(0.726)	(0.709)
logpop			-0.131	-0.138	-0.260	-0.273	-0.206
			(0.323)	(0.317)	(0.367)	(0.372)	(0.351)
depend			0.114	0.135	0.153	0.180	0.273
			(0.439)	(0.444)	(0.441)	(0.452)	(0.449)
polity2			0.002	0.002	0.001	0.001	0.002
			(0.003)	(0.003)	(0.004)	(0.004)	(0.004)
urban			0.009***	0.009***	0.010***	0.010***	0.009***
			(0.003)	(0.002)	(0.003)	(0.003)	(0.003)
war			0.012	0.013	0.008	0.009	0.010
			(0.023)	(0.022)	(0.025)	(0.024)	(0.026)
lagopenness			-0.087	-0.083	-0.064	-0.062	-0.056
			(0.074)	(0.072)	(0.083)	(0.083)	(0.081)
Time Dummies	yes	yes	yes	yes	yes	yes	yes
# Obs.	111	111	105	105	105	105	105
# countries	28	28	27	27	27	27	27
R^2	0.396	0.398	0.566	0.567	0.573	0.575	0.584

Notes: Robust standard errors in parentheses.
* significant at 10%; ** significant at 5%; *** significant at 1%.

Table 13: non-OECD, 1964-2000

	(1)	(2)	(3)	(4)	(5)	(6)
importdiv	1.404*	1.509**	4.298***	6.070***	5.779***	2.552**
	(0.750)	(0.753)	(1.342)	(1.853)	(1.971)	(1.108)
importdiv×loggdp	-0.073	-0.086*	-0.116**	-0.189***	-0.198***	-0.150**
	(0.045)	(0.046)	(0.047)	(0.065)	(0.071)	(0.065)
diff$_r$		-0.869**	0.048	0.414	0.309	-0.659
		(0.360)	(0.469)	(0.532)	(0.531)	(0.417)
importdiv×diff$_r$			-3.641**	-4.528**	-3.793**	
			(1.484)	(1.756)	(1.800)	
loggdp	-0.167***	-0.155***	-0.155***	-0.168***	-0.141**	-0.146**
	(0.049)	(0.050)	(0.049)	(0.059)	(0.062)	(0.063)
logpop	0.237***	0.243***	0.241***	0.255**	0.297**	0.295**
	(0.083)	(0.084)	(0.086)	(0.126)	(0.128)	(0.127)
polity2				-0.005**	-0.005**	-0.005**
				(0.002)	(0.002)	(0.002)
depend				-0.263*	-0.226	-0.187
				(0.141)	(0.144)	(0.145)
lagopenness				0.102***	0.107***	0.121***
				(0.031)	(0.031)	(0.030)
aidpc					0.000	0.000
					(0.000)	(0.000)
war					0.014***	0.014**
					(0.005)	(0.005)
urban					-0.004*	-0.005**
					(0.002)	(0.002)
Time Dummies	yes	yes	yes	yes	yes	yes
# Obs.	907	907	907	758	733	733
# countries	127	127	127	112	109	109
R^2	0.141	0.149	0.156	0.199	0.212	0.205

Notes: Robust standard errors in parentheses.
* significant at 10%; ** significant at 5%; *** significant at 1%.

Table 14: non-OECD, 1964-2000

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
importdiv	0.403**	1.578	1.480	0.269	1.593	0.181		
	(0.189)	(1.410)	(1.413)	(2.253)	(1.408)	(4.266)		
importdiv×loggdp		-0.069	-0.064	-0.048	-0.070	-0.061		
		(0.079)	(0.079)	(0.082)	(0.079)	(0.087)		
diff$_r$			-0.312	-0.679				
			(0.421)	(0.589)				
importdiv×diff$_r$				1.514			0.635**	
				(2.187)			(0.317)	
diff$_l$					-0.149	-0.570		
					(0.790)	(1.318)		
importdiv×diff$_l$						1.429		0.451**
						(3.762)		(0.213)
loggdp	-0.197***	-0.173***	-0.169**	-0.170**	-0.172**	-0.170**	-0.196***	-0.196***
	(0.062)	(0.065)	(0.067)	(0.066)	(0.066)	(0.066)	(0.063)	(0.062)
logpop	0.359*	0.346*	0.339*	0.337*	0.346*	0.344*	0.361*	0.357*
	(0.195)	(0.195)	(0.195)	(0.195)	(0.196)	(0.196)	(0.194)	(0.194)
depend	-0.048	-0.080	-0.068	-0.071	-0.075	-0.074	-0.058	-0.054
	(0.197)	(0.196)	(0.201)	(0.201)	(0.200)	(0.200)	(0.195)	(0.196)
polity2	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
urban	-0.007	-0.007	-0.006	-0.006	-0.007	-0.006	-0.007	-0.007
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
war	0.019***	0.020***	0.020***	0.020***	0.020***	0.020***	0.019***	0.019***
	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)
lagopenness	0.070*	0.070*	0.068	0.070*	0.069	0.070	0.073*	0.071*
	(0.042)	(0.042)	(0.042)	(0.042)	(0.042)	(0.043)	(0.041)	(0.041)
Time Dummies	yes	yes	yes	yes	yes	yes	yes	yes
# Obs.	758	758	758	758	758	758	758	758
# groups	195	195	195	195	195	195	195	195
R^2	0.246	0.247	0.248	0.248	0.247	0.247	0.245	0.246

Notes: Robust standard errors clustered by countries in parentheses. Fixed effects interacted with period.
* significant at 10%; ** significant at 5%; *** significant at 1%.

Table 15: No log variables: OECD, 1964-1983

	(1)	(2)	(3)	(4)	(5)	(6)
importdiv	-2.597	224.079***	199.011***	171.545***	138.859***	-10.885
	(4.765)	(52.605)	(42.978)	(47.316)	(50.520)	(71.015)
importdiv×gdp		-11.307***	-9.589***	-11.945***	-6.524**	-7.906***
		(2.599)	(2.171)	(2.483)	(2.633)	(2.829)
diff$_r$			-32.698***	-91.973***		
			(10.073)	(26.365)		
importdiv×diff$_r$				136.335**		
				(63.470)		
diff$_l$					-55.650***	-161.316***
					(17.955)	(39.257)
importdiv×diff$_l$						213.220***
						(78.660)
gdp	-9.193***	-4.214*	-4.587**	-3.189	-6.172**	-5.139**
	(2.196)	(2.278)	(2.190)	(2.391)	(2.371)	(2.495)
pop	13.025***	12.880***	11.119***	9.200**	11.153***	8.564**
	(4.527)	(4.095)	(4.114)	(4.309)	(4.066)	(4.278)
depend	7.984	10.082**	13.319**	12.134**	13.516**	12.831**
	(5.074)	(4.598)	(5.131)	(5.162)	(5.371)	(5.307)
polity2	0.176***	0.157***	0.159***	0.158***	0.157***	0.159***
	(0.053)	(0.051)	(0.052)	(0.050)	(0.054)	(0.052)
urban	0.149**	0.104	0.112	0.102	0.119	0.115
	(0.073)	(0.075)	(0.077)	(0.075)	(0.073)	(0.071)
war	0.460	-0.369	-0.258	-0.330	-0.223	-0.264
	(0.337)	(0.359)	(0.336)	(0.351)	(0.359)	(0.379)
lagopenness	0.023	-0.001	0.008	0.003	0.011	0.008
	(0.039)	(0.037)	(0.038)	(0.038)	(0.037)	(0.037)
Time Dummies	yes	yes	yes	yes	yes	yes
# Obs.	124	124	124	124	124	124
# countries	26	26	26	26	26	26
R^2	0.592	0.670	0.690	0.700	0.697	0.711

Notes: Robust standard errors in parentheses.
*significant at 10%; ** significant at 5%; *** significant at 1%.

Table 16: Arellano-Bond GMM estimation: OECD, 1964-1983

	(1)	(2)	(3)	(4)	(5)	(6)
laggovshare	0.465***	0.392***	0.411**	0.306**	0.420**	0.336**
	(0.116)	(0.124)	(0.171)	(0.148)	(0.164)	(0.151)
importdiv	-0.363*	6.637***	6.141***	4.669***	5.465**	-0.964
	(0.190)	(2.141)	(2.130)	(1.744)	(2.390)	(2.403)
importdiv×**loggdp**		-0.349***	-0.321***	-0.374***	-0.284**	-0.303***
		(0.102)	(0.103)	(0.085)	(0.122)	(0.103)
$\mathbf{diff}_r$				-3.464***		
				(0.674)		
importdiv×$\mathbf{diff}_r$				5.294***		
				(1.253)		
$\mathbf{diff}_l$					-0.453	-4.972***
					(0.917)	(1.221)
importdiv×$\mathbf{diff}_l$						8.348***
						(1.909)
loggdp	-0.267***	-0.181***	-0.256***	-0.199**	-0.260***	-0.243**
	(0.098)	(0.068)	(0.084)	(0.095)	(0.087)	(0.097)
logpop	0.663***	0.687***	0.567***	0.382**	0.535***	0.410**
	(0.169)	(0.174)	(0.167)	(0.180)	(0.173)	(0.187)
polity2	0.008***	0.008***	0.008***	0.008***	0.008***	0.008***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
depend	0.133	0.158	0.171	0.228	0.187	0.206
	(0.170)	(0.160)	(0.191)	(0.185)	(0.191)	(0.196)
lagopenness			-0.015	-0.072	-0.016	-0.049
			(0.063)	(0.062)	(0.065)	(0.061)
war			0.000	0.004	0.001	0.006
			(0.014)	(0.016)	(0.015)	(0.016)
urban			0.008***	0.009***	0.008***	0.009***
			(0.002)	(0.002)	(0.002)	(0.002)
Time Dummies	yes	yes	yes	yes	yes	yes
# Obs.	98	98	98	98	98	98
# countries	26	26	26	26	26	26

Notes: Robust standard errors in parentheses.
*significant at 10%; ** significant at 5%; *** significant at 1%.

Table 17: Robustness: OECD, 1964-1983

	alternative measure for importdiv			alternative measure for diff	yearly data		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
importdiv[1)]	1.976***	1.684***	1.535***	-3.510	10.194***	9.500***	6.277***
	(0.439)	(0.438)	(0.419)	(3.505)	(1.339)	(1.172)	(1.311)
importdiv×**loggdp**[1)]	-0.103***	-0.088***	-0.082***	-0.375***	-0.525***	-0.535***	-0.474***
	(0.023)	(0.023)	(0.022)	(0.142)	(0.066)	(0.070)	(0.072)
diff$_r$[2)]		-1.538***		-53.529***		-1.660***	
		(0.470)		(10.887)		(0.396)	
importdiv×**diff**$_r$[2)]				77.595***		2.144**	
				(21.330)		(1.004)	
diff$_l$			-2.328***				-2.962***
			(0.686)				(0.666)
importdiv×**diff**$_l$							3.808***
							(1.462)
loggdp	0.523**	0.471**	0.411*	-0.124	-0.210***	-0.191***	-0.222***
	(0.227)	(0.214)	(0.207)	(0.122)	(0.057)	(0.059)	(0.060)
logpop	0.405**	0.369**	0.380**	0.261	0.818***	0.699***	0.689***
	(0.170)	(0.165)	(0.168)	(0.195)	(0.101)	(0.105)	(0.103)
polity2	0.009***	0.009***	0.009***	0.008***	0.008***	0.008***	0.008***
	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
depend	0.414	0.386*	0.358	0.308	0.322***	0.371***	0.379***
	(0.253)	(0.220)	(0.215)	(0.215)	(0.108)	(0.115)	(0.116)
lagopenness	-0.214***	-0.254***	-0.238***	-0.253***	-0.176***	-0.189***	-0.190***
	(0.050)	(0.038)	(0.037)	(0.041)	(0.027)	(0.026)	(0.026)
urban	0.007**	0.007***	0.007***	0.011***	0.009***	0.010***	0.010***
	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)
war	0.039***	0.025**	0.019*	-0.001	-0.011	-0.009	-0.009
	(0.012)	(0.010)	(0.011)	(0.021)	(0.009)	(0.009)	(0.009)
Time Dummies	yes	yes	yes	yes	yes	yes	yes
# Obs.	124	124	124	124	498	498	498
# countries	26	26	26	26	26	26	26
R^2	0.803	0.829	0.834	0.822	0.716	0.729	0.729

Notes: Robust standard errors in parentheses.
*significant at 10%; ** significant at 5%; *** significant at 1%.

1) In column (1) to (3) the alternative measure for *importdiv* is used.

2) In column (4) the alternative measure *lov* instead of $diff$ is used.

B Appendix

Table 18: Elasticity of substitution: sample means

	Broda and Weinstein (2006)'s estimated elasticity of substitution	
Rauch's classification	1972-1988	1990-2001
differentiated goods	5.2	4.7
reference priced goods	7.8	4.9
goods on organized exchange	15.3	11.6

Source: Broda and Weinstein (2006)

Table 19: Data and Sources

Variable	Description	Source
g	log-share of government consumption to real GDP (in %) from Penn World Tables 6.2	http://pwt.econ.upenn.edu/
loggdp	log real GDP (Laspeyeres method in 2000 prices) from Penn World Tables 6.2	http://pwt.econ.upenn.edu/
logpop	log of total population in thousands from Penn World Tables 6.2	http://pwt.econ.upenn.edu/
importdiv	number of different imported 4-digit products (Standard International trade classification, Rev. 2), normalized 0-1	World Trade Data (Feenstra and Lipsey, 2005) http://cid.econ.ucdavis.edu/data/undata/undata.html
$diff_r$	share of differentiated on total imported products	Rauch (1999) and World Trade Data (Feenstra and Lipsey, 2005)
$diff_l$	share of differentiated plus share of reference priced on total imported products	Rauch (1999) and World Trade Data (Feenstra and Lipsey, 2005)
*polity*2	Composite Polity index ranging from -10 (hereditary monarchy) to 10 (consolidated democracy)	http://www.systemicpeace.org/inscr/inscr.htm
depend	Dependency ratio is the share of population below 15 and beyond 64 to the population between 15 and 64 from World Development Indicators	World Development Indicators 2005, World Bank
urban	The share of total population living in urban areas from World Development Indicators	World Development Indicators 2005, World Bank
war	ACTOTAL from Major Episodes of Political Violence (MEPV) and conflict regions, range from 0 (no violence) to 10	http://www.systemicpeace.org/warlist.htm
lagopenness	log-share of export plus import to real GDP (in %) from Penn World Tables 6.2	http://pwt.econ.upenn.edu/

Table 20: List of Countries

Afghanistan	Djibouti	Laos	Samoa
Albania	Dominican Republic	Latvia	Saudi Arabia
Algeria	Ecuador	Lebanon	Senegal
Angola	Egypt	Liberia	Seychelles
Argentina	El Salvador	Lithuania	Sierra Leone
Armenia	Equatorial Guinea	Macedonia	Singapore
Australia	Estonia	Madagascar	Slovak Republic
Austria	Ethiopia	Malawi	Slovenia
Azerbaijan	Fiji	Malaysia	Somalia
Bahamas	Finland	Mali	South Africa
Bahrain	France	Malta	Spain
Bangladesh	Gabon	Mauritania	Sri Lanka
Barbados	Gambia	Mauritius	St. Kitts and Nevis
Belarus	Georgia	Mexico	Sudan
Belgium	Germany	Mongolia	Suriname
Belize	Ghana	Morocco	Sweden
Benin	Greece	Mozambique	Switzerland
Bermuda	Guatemala	Nepal	Syria
Bolivia	Guinea	Netherlands	Taiwan
Bosnia and Herzegovina	Guinea-Bissau	Netherlands Antilles	Tajikistan
Brazil	Guyana	New Zealand	Tanzania
Burkina Faso	Haiti	Nicaragua	Thailand
Burundi	Honduras	Niger	Togo
Cambodia	Hungary	Nigeria	Trinidad and Tobago
Cameroon	Iceland	Norway	Tunisia
Canada	India	Oman	Turkey
Central African Republic	Indonesia	Pakistan	Turkmenistan
Chad	Iran	Panama	Uganda
Chile	Iraq	Papua New Guinea	Ukraine
China	Ireland	Paraguay	United Arab Emirates
Colombia	Israel	Peru	United Kingdom
Costa Rica	Italy	Philippines	United States
Cote d'Ivoire	Jamaica	Poland	Uruguay
Croatia	Japan	Portugal	Uzbekistan
Cuba	Jordan	Qatar	Venezuela
Cyprus	Kenya	Republic of Korea	Vietnam
Czech Republic	Kiribati	Romania	Yemen
Dem. Rep. Korea	Kuwait	Russia	Zambia
Denmark	Kyrgyzstan	Rwanda	Zimbabwe

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